15¢

September 8, 1951

TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

PUBLIC LIBRARY
SEP 1951
DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Swamp Jumper

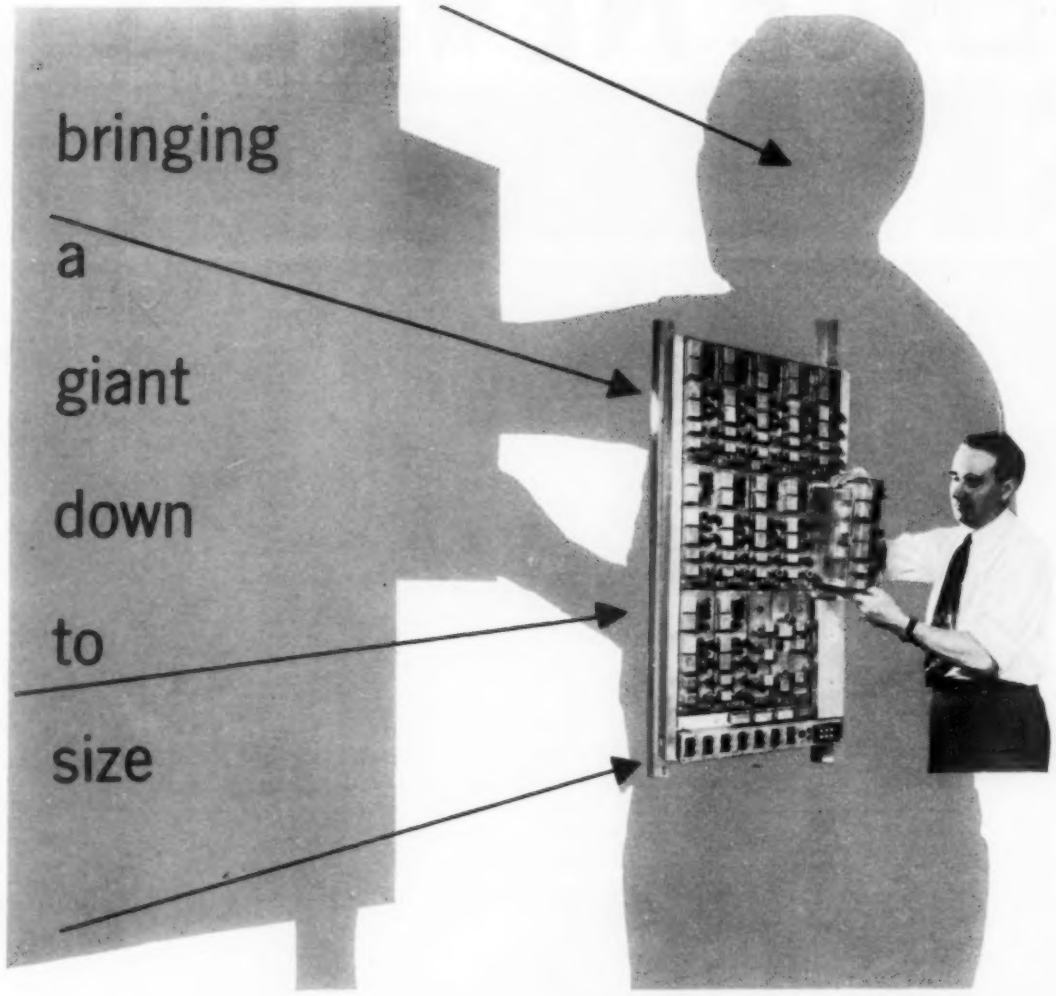
See Page 151

A SCIENCE SERVICE PUBLICATION

$5.50 A YEAR

VOL. 60 NO. 10 PAGES 145-160

bringing a giant down to size



New type N Repeater installation. Engineer shows ease of servicing—a spare unit can be plugged in with little or no interruption to service when repairs are needed.

"CARRIER SYSTEM" telephony is economical, because many voices use the same pair of wires. But the extra equipment needed once limited it to the longer distances.

Now Bell Laboratories have developed new short-haul carrier, economical down to 25 miles, sending 12 conversations on two pairs of wires in a cable.

Keys to the new system are new circuits, miniature tubes, pocket-size wave filters and Permalloy "wedding ring" transformer cores that will barely slip over a man's finger. New manufacturing processes were developed in co-operation with the Western Electric Company. Components are pressed into a plastic mounting strip with heat, a score at a time, instead of being mounted separately.

With this new carrier system more service can be provided without laying more cables. Tons of copper and lead can now be conserved for other uses. It's another example of how science takes a practical turn at Bell Telephone Laboratories, to improve service and to keep its cost down.

BELL TELEPHONE LABORATORIES

WORKING CONTINUALLY TO KEEP YOUR TELEPHONE SERVICE ONE OF TODAY'S GREATEST VALUES

MEDICINE

Steps to Virus Conquest

Successful vaccine against poliomyelitis could result from relatively harmless strains of the virus that have now been grown in test tubes.

➤ HOPE FOR a successful vaccine against poliomyelitis appeared in a report that relatively harmless strains of polio vaccine grown in tests tubes or flasks have been used successfully to vaccinate mice.

The report was given by Dr. John F. Enders of Harvard Medical School at the Second International Poliomyelitis Conference in Copenhagen, Denmark.

The weakened strains that protected mice were developed as a result of a three-year research project by Dr. Enders and his colleagues, Drs. Frederick C. Robbins and Thomas H. Weller.

These scientists have been able to grow the polio virus in test tubes on cultures of human embryonic tissues or on adult tissues obtained from surgical operations. Previously scientists believed the polio virus would only grow on nervous tissue inside the living body.

In the generations of virus grown on the cultures of tissue, new strains appeared. These new strains had practically no ability to cause the disease in mice and were used to vaccinate the animals against more virulent strains.

While a polio vaccine for humans is still far from ready, the fact that the virus can be grown outside the body gives scientists a great lift for further research in many directions.

Chemical Against Virus

If viruses such as cause infantile paralysis, influenza and other serious diseases are conquered, it will be through chemicals, not vaccines.

Evidence in favor of this view was reported by Dr. Frank L. Horsfall of the Rockefeller Institute, New York, at the same International Poliomyelitis Conference.

The chemicals will act by interrupting the multiplication of the virus within the cell it has attacked. Some chemicals which can stop viruses in this way have already been found.

In infections with pneumonia virus of mice, the multiplication of the virus can be stopped by giving the mouse a complex sugar which occurs in the outer envelope or capsule of a bacterium responsible for a rather rare type of pneumonia in man. The organism is known as the *Klebsiella pneumoniae* and the sugar is known as a capsular polysaccharide.

This same capsular polysaccharide also has the ability to interrupt the multiplication of mumps virus in the cells of the living chick embryo, Dr. Horsfall reported.

Two chemical compounds have been found which are capable of interrupting the multiplication of the virus of Influenza A in tissue cultures, he said. They are dl-methoxinine and dl-ethionine.

Other chemicals were used successfully to inhibit the multiplication of two types of bacteriophages, viruses which attack and destroy bacteria.

Stopping virus diseases by vaccines depends on the theory that the body produces antibodies in reaction to specific viruses that invade it. This view is widely accepted but Dr. Horsfall believes the antibody idea is not adequate to explain many phases of recovery from virus diseases.

For instance, he said, no one has ever found antibodies in plants, yet they recover from virus infections. Also some virus diseases, like herpes simplex (cold sores) run their course despite aboundant antibodies, while others, like psittacosis (parrot fever), display much active virus, but little antibodies.

Dr. Horsfall offered instead of antibodies the suggestion that the invading virus and some cell chemical system, limited in extent, strike some sort of balance.

Iron Lungers Weaned

Iron lungers among recovering poliomyelitis patients are being weaned on rocking beds.

The rocking bed is like an ordinary hospital bed mounted on rockers and operated by an electric motor. It rocks, or seesaws, in a rhythm synchronized with the patient's breathing. As it rocks the patient's head up, the weight of the abdominal organs pulls the diaphragm down, expanding the chest cavity and sucking air into the lungs. Then, when the foot rocks up, the abdominal organs press against the diaphragm forcing air out of the lungs.

Polio patients who have been in an iron lung, or respirator, which keeps them breathing by alternating pressures until their breathing muscles can take over, are often scared to stay out of the lung. It is like a person who has broken a leg and is scared at first to walk without crutches even after his leg has healed. For the polio iron lungers, the rocking bed is a good weaning device.

The rocking bed was developed in 1946 at the Municipal Hospital in Pittsburgh and has been increasingly used since then. It was shown at the Conference.

Science News Letter, September 8, 1951

***BABY PORCUPINE RAT**—Its quills and rat-like features proclaiming its name, this baby porcupine rat was brought back from North Boreno. An Army Medical Center zoologist captured the animal while collecting specimens for the Center's study of scrub typhus. It can now be seen at the National Zoological Park in Washington for the first time. There is speculation about the way it will look when fully grown because American scientists have not been able to study the little creature.*

PHARMACOLOGY

Anti-Germ Chemicals

Seaweed yields material that stops test tube growth of micro-organisms. Safer gold medicine for arthritis treatment suggested to pharmacologists.

➤ ANTI-GERM remedies of the future may come from seaweed, it appears from a report by University of California College of Pharmacy researchers in San Francisco to the American Pharmaceutical Association meeting in Buffalo, N. Y.

They tested about three dozen species of marine algae from the central California coast. Material extracted from eight of these stopped the test tube growth of three kinds of micro-organisms: *Staphylococcus aureus* familiar in the boils, the colon bacillus and *Pseudomonas aeruginosa*, the bacillus that produces blue pus in wounds.

The germ-stopping activity of these seaweeds was not due to their iodine content.

Scientists reporting these fiindings were: Robertson Pratt, Henry Mautner, Yi-Hshien Sha, Grace Gardener and Jean Dufrenoy.

Excessive Sweating

Excessive sweating was effectively controlled in 44 volunteer patients by a drug called banthine bromide, Dr. Arthur G. Zupko of the St. Louis College of Pharmacy and Allied Sciences reported at the meeting.

The drug is available only on a physician's prescription. Its effect in checking sweating was accidentally discovered during its use in treatment of stomach ulcers.

Although 40 of the patients showed good results in control of the excessive sweating when taking two to three tablets of banthine daily, two patients with severe excessive sweating were not helped by four tablets daily.

Constipation, heartburn and headache were the most common side effects, though none was severe. The drug must be taken continously to control the excessive sweating.

Safer Arthritis Treatment

A safer gold medicine for treating rheumatoid arthritis may be at hand, it appears from a study reported by Dr. J. Leon Lichtin of the Cincinnati College of Pharmacy to the pharmacists.

Solution of the arthritis problem will eventually come through hormones, such as cortisone and ACTH and perhaps others, Dr. Lichtin believes. But meanwhile a less toxic gold compound than those now used will give doctors one more weapon against arthritis.

The new and safer gold medicine for arthritis is gold cincophen. In tests on mice it took 1.7 times more of this compound to kill a mouse than of currently used gold salts, Dr. Lichtin found.

This and several other new gold compounds, among them two gold vitamins, gold nicotinic acid and gold thiamine, were made by Dr. Lichtin and Dr. Loyd E. Harris while they were at Ohio State University College of Pharmacy, Columbus. Dr. Harris is now in military service.

The gold vitamins did not seem as promising as the gold cincophen compounds, so far as lack of toxicity is concerned.

Further testing of them on animals and perhaps eventual trial in patients are needed, but Dr. Lichtin said he does not plan to make such studies himself.

Science News Letter, September 8, 1951

New standard *kilogram*, on which future determinations of mass in Canada will be based, has arrived in Ottawa after certification by the International Bureau of Weights and Measurements.

Question Box

AGRICULTURE

How could lambs become more plentiful? p. 153.

ICHTHYOLOGY

What is the main diet item of the kingfisher? p. 156.

MEDICINE

How are iron lung patients being weaned? p. 147.

What method of artificial respiration has worked for polio patients? p. 152.

Why does the U. S. not cooperate in the fight against yellow fever? p. 154.

PSYCHOLOGY

What is indicated if you are good at guessing time intervals? p. 149.

Why should American Communists now in jail be studied? p. 149.

RADIO

What can cause bands of interference on TV sets? p. 159.

SOCIOLOGY

What sex is the first-born child more likely to be? p. 152.

TECHNOLOGY

How can the shortage of sulfuric acid be alleviated? p. 153.

Photographs: Cover, Shell Oil Company; p. 147 and p. 154, Fremont Davis; p. 150, U. S. Geological Survey; p. 151, Stanford University.

SCIENCE NEWS LETTER

VOL. 60 SEPTEMBER 8, 1951 No. 10

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1951, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Science: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: Frank R. Ford, Evansville Press; John T. O'Rourke, Washington Daily News.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ann Ewing, Wadsworth Likely. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

PSYCHOLOGY

Keep Wits Sharpened

Mind ages less if used regularly. Self-hypnosis as cure for ulcers, faster reading after training program reported to psychologists' meeting.

➤ DETERIORATION of the mind with age is much less for intelligent individuals, Dr. Milton S. Gurvitz, of Hillside Hospital, Glen Oaks, N. Y., reported to the American Psychological Association meeting in Chicago.

Evidently brighter people find more opportunity to practice their intelligence and keep their wits sharpened than do those who are less well endowed, he told the meeting. Dr. Gurvitz found, in testing over 4,000 persons that those with an initial IQ of only 65 lost 80 points in tests scores between the ages of 20 and 54. The drop for those with an IQ of 135 was only 26 points.

The decline begins early in life, scores of those in the late twenties being lower than those between 20 and 24.

Loss of intelligence with age is also greater for those with less education. College graduates lose less than high school graduates, but those with high school training decline less than those who left school during their grammar school days.

Figures showing decline of intelligence with advancing age have probably been misleading, Dr. Curvitz pointed out, due to the fact that educational opportunities were less for the older population.

Word Recognition

College students need training in recognition of words, three members of the Counseling Center, University of Maryland, Baltimore, told the meeting.

Although word study is usually taught in the fourth or fifth grades, if at all, tests taken by 1,500 new students at the University of Maryland showed so much variation that it is no wonder that some students read twice as fast as others, the scientists said.

Training in specialized vocabularies for students entering the various colleges was also urged by the investigators: Drs. Edgar D. Gates, Francis Oralind Triggs and associates.

Asphalt Barrier

An asphalt black top on some lanes of a highway acts as a barrier to keep motorists off those lanes. This was reported to the American Psychological Association by Dr. H. W. Case and R. Brenner of the University of California at Los Angeles.

Statistical study was made of motorists making use of the extra lanes added on to widen a three-lane concrete highway. For a distance of two-tenths of a mile the added lanes were paved with a black top insert instead of concrete.

White lines marking off the four traffic lanes increased the number of motorists who moved over into the new second lane at the widened section. But at least half of the motorists who would have moved over did not do so when the new lane had a black top.

Even the presence of white lines did not change the barrier effect of the black top.

Reading Improvement

Air Force officers learned to read 64 per cent faster as a result of a voluntary 20 period reading improvement program, Drs. Thomas F. Staton and Ray C. Maize, of the Air Command and Staff School, reported to the meeting.

For 30 minutes of each period the officers read books of graded levels of difficulty, using a machine which uncovered one line of type at a time at a set rate of speed. After ten such periods, current affairs reading material in current news magazines were substituted for the graded reading. During the last five periods the officers read without the reading rate controller.

Although reading speed increased greatly, it was at no sacrifice in comprehension. in fact, understanding was increased just a little.

At the beginning of the course, all the students were slow readers, averaging 16 per cent lower in speed than did their entire class in the Command and Staff School.

Ulcer Relief

Self hypnosis works better than medicine for relief of peptic ulcer, Dr. Hamilton Moody, of the Long Beach VA Hospital and the University of California at Los Angeles told the psychologists.

The advantage of the hypnotic therapy is only slight, however, he found.

The conclusion is based on study of ten hospitalized patients with duodenal ulcer. These ten patients were taught, in 15 hours of special training, the technique of autohypnosis to produce relaxation. They received no medication at all.

These patients were compared with another group who received the usual medical therapy. The two groups were carefully matched not only from the point of view of severity of symptoms, but also on the basis of age, sex, marital status and other social factors.

Although the results obtained do not necessarily indicate that the hypnosis permanently reduced the peptic ulcer symptoms, Dr. Moody pointed out, those who treated themselves with hypnotic relaxation were shown by X-rays to be benefited more than those who received the conventional medical treatment.

Time Intervals

How good are you at estimating when 30 seconds or a minute has passed by?

If you feel that your parents were dominating, the chances are that you will overestimate such a short time interval.

This is indicated by experiments reported to the meeting by Drs. Seymour Fisher and Rhoda Lee Fisher of the Houston VA Hospital and Houston Jewish Vocational Service, Texas.

The more dominating an individual feels his parents to be, they found, the more he overvalues time. He perceives it as precious, "doled out."

Underestimation of time intervals was not found to be significant, however.

Lazy Students

There is no such thing as a lazy student, the psychologists learned.

Indolence and industriousness are very specific for different activities, Dr. W. C. Krathwohl, of the Illinois Institute of Technology, Chicago, reported.

If a teacher of English observes that a particular student is lazy in her class, that is no indication that the same student would be lazy in chemistry, mathematics or physics.

Dr. Krathwohl studied the work habits of engineering students in these four subjects and found almost no relation between industriousness in any one and in the others. A possible exception is between mathematics and chemistry where a very slight relationship was observed.

Study Communists

Psychological study of the top American Communists now in jail was urged at the meeting by Dr. G. M. Gilbert, of the Veterans Administration, who will soon be on the faculty of Michigan State College at East Lansing. Dr. Gilbert, as prison psychologist at the Nuremberg trials, made such a study of the top Nazis.

After the shooting is over in Korea, Dr. Gilbert predicted, the psychological warfare will go on probably for the rest of our lives. It is up to us to find out just what the appeal is that Communism makes, especially to the under-privileged. Otherwise Russia may defeat us in peace more readily than in war by lining up all of Asia against us through her propaganda and psychological warfare.

MEDICINE

Bacitracin Saves Patient When Penicillin Fails

➤ BACITRACIN, antibiotic drug obtained originally from germs in an infected wound, is credited with saving the life of a patient ill with a serious heart ailment.

The case, said to be the first in which bacitracin was "largely if not entirely" responsible for the patient's recovery, is reported by Drs. Charles K. Friedberg and Mortimer E. Bader of New York in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 1).

The patient, a 28-year-old diamond cutter, had a staphylococcus infection of the lining membrane of his heart. Acute bacterial endocarditis is the medical term for this condition.

"Huge doses" of penicillin, aureomycin and chloromycetin were given over a period of 12 days. But the patient was still critically ill. So the doctors decided to try bacitracin.

Laboratory tests had shown that the germs causing the trouble were very sensitive to the action of bacitracin. This antibiotic was given together with penicillin and aureomycin, so it is not possible to say that bacitracin alone was responsible for the cure. The doctors think it was, however, since the fever went down rapidly and the patient began to get well promptly after bacitracin was added to the other antibiotics.

Bacitracin seems likely to become more important in the future because doctors are finding more and more strains of staphylococcus and other germs that are resistant to penicillin.

Science News Letter, September 8, 1951

METEOROLOGY

Hotter than Usual Weather Predicted for Half of Nation

➤ SEPTEMBER IS going to be hotter than usual for just about half the nation, east of a line extending from the Wisconsin-Minnesota area down to the New Mexico-Texas area. West of the continental divide and in the western portions of the northern plains area, September will be cooler than normal. In between the two areas, about normal temperatures will prevail.

This is what the Weather Bureau's Extended Forecast Section predicts in its regular, twice-a-month 30-day forecast.

Plains and Rocky Mountain states can expect more than the usual amounts of rain during September. East coastal areas will have moderate to locally heavy amounts of rain. Less than normal rainfall can be expected in a strip extending from the Gulf States to New England. Elsewhere near normal amounts are expected.

Science News Letter, September 8, 1951

BEDROCK SURVEY—Going over the side to start a day's work is the transmitter of a standard Bludworth depthfinder, used as a check in shallow waters of the more powerful apparatus with which the Bay of Fundy was recently surveyed. The scene is aboard the David C. MacNichol, a coastal freighter pressed into service as a research vessel.

NATURAL RESOURCES

Tide Power Project

Survey bottom of Passamaquoddy Bay with view to taking advantage of tides of Bay of Fundy. Sonar equipment shows it to be mostly rock, not mud and silt.

➤ THE PASSAMAQUODDY electric project to make electricity with the high tides of the Bay of Fundy off the Maine coast is a long step nearer realization as a result of a survey of the bottom of Passamaquoddy Bay.

The survey, made by a new method, showed that the bottom of the bay is mostly solid rock rather than the mud and silt engineers had previously believed it to be. This means that it is feasible from an engineering point of view to build a dam to harness the tides.

The survey, done jointly by the U. S. Geological Survey and the Army Engineers, used Navy sonar equipment which bounces a sound signal off the bottom. The signal reveals not only how far down the bottom is, but also what kind of a bottom it is—silt, gravel or rock. In addition, if the bottom is silt or gravel, the sonar signals tell how deep it is and at what level the solid rock starts.

The survey took only a few weeks and cost only $50,000 as compared with much more time and an estimated $2,000,000 for the old method. Previously engineers had to use the coring method in which the bottom was plugged—like a watermelon.

The old method was used in 1935-1936 in another test area at Passamaquoddy. At this time, a great deal of sediment was found and it was deduced that the rest of the coastal area also was covered with sediment. This would have made building a dam extremely difficult and costly. However, the new sonar survey showed, according to the Geological Survey, that the upper two-thirds of the coastal area contains almost no sediment.

Last fall a joint Canadian-American commission reported that it would take $3,900,000 to determine whether the Passamaquoddy project was feasible. Of this, $2,000,000 was to be spent in finding out what kind of a bottom there was in Passama-

quoddy Bay. Now this work has been done with only $50,000 and the surveyors came up with a favorable answer.

In making the survey, the sonar device was hung over the side of a coastal freighter by a davit. The ship cruised slowly up and down in a series of more or less parallel courses, while navigators kept exact records of their position. The device is so sensitive that even schools of fish showed up and were recognized by the operators.

Still to be determined are the financial factors involved in the Passamaquoddy project. There are indications that these might be favorable.

Science News Letter, September 8, 1951

INVENTION

Two-Picture Camera Does Away with Photo Proofs

➤ TWO PICTURES are taken at the same time with a camera designed by Carl L. Mourfield, Dallas, Texas, on which he received patent 2,565,618. One is on flat paper film; the other on photographic negative film. The advantage of this camera is that no proofs need be made from the negative. A substitute for a proof is immediately available on the flat paper film.

Science News Letter, September 8, 1951

AERONAUTICS

Helicopter Aids Oil Location in Swamps

See Front Cover

➤ THE HELICOPTER has a new job. It is helping geologists locate deep underground formations favorable for oil by the so-called seismic method.

In this method explosions are made near the surface which send sound waves deep into the earth. These shock waves, as they are called, are reflected back to the surface by geological formations encountered. The reflected waves are picked up by receiving instruments in the vicinity of the explosions. From them much about the underground formations can be determined.

The part the helicopter plays is hopping the geologists from one blast station to another. In the great swamp areas along the Gulf Coast in Louisiana, Texas and Venezuela what are called marsh buggies are in general use. They are motor vehicles with very large wheels which are equipped with gigantic rubber tires. Even then, travel is slow and difficult.

That is why helicopters, such as the one shown on the cover of this week's SCIENCE NEWS LETTER, have been substituted by Shell Oil Company in Marsh Island, La., for the marsh buggy. They are proving successful, for with them the seismic operation is accomplished some four times faster than with the lumbering buggy, officials declare.

Science News Letter, September 8, 1951

METEOROLOGY

Ice Age Weather Possible

Pattern of unusual weather might persist for months or decades and result in surface changes which could produce "ice age epochs."

➤ THE POSSIBILITY that a pattern of unusual weather could persist for months, years or decades and "result in ice age epochs" was seen by Jerome Namias, chief of the extended forecast section of the U. S. Weather Bureau in Washington.

Mr. Namias studied the persistent weather pattern of the winter of 1949-1950 to try to find out more about "anomalies" in weather. He was cautious about his conclusions, remarking that "adequate physical explanation is clearly beyond the present day limitations of theoretical meteorology."

Mr. Namias hypothesized, however, that the persistence of an anticyclone—a clockwise whirl in the atmosphere—in the eastern Pacific in the winter of 1949-1950 was probably a result of two main factors: its harmony with the general wave pattern of the air in the upper atmosphere, and an encouraging influence resulting from the action of the sun upon the earth at that time of year.

If that hypothesis is correct, he said, then large-scale atmospheric states carry with them their own seeds for creating new states. And the same weather pattern, occurring at different times of the year can behave in radically different manners.

Puzzling persistence of "unusual" weather patterns for long periods, and also abrupt changes in long-period weather regimes, he further concluded, may find their explanation in this self-developing mechanism. And, finally, the persistence could build up over a period of time long enough to change the amount of snow cover or the ocean temperature and this could result in ice epochs.

Mr. Namias traced the path of the anticyclone as it travelled northward in the Pacific from a point south of Alaska and west of Lower California. It began in mid-December and by the month of March it had curved up west and north of Alaska and down into Canada. To see more clearly the long range effects of this anticyclone, he used averages over the period of a month, rather than trying to work with day-to-day variations in weather conditions.

The anticyclone was one of the factors which produced an unusual winter in this country. For much of the time, temperatures in the east were above normal and temperatures in the west below normal.

Mr. Namias believes that the anticyclone persisted so long because it was in harmony with the rest of the weather conditions in the northern hemisphere. The pattern in the atmosphere contributed to its persistence. If it had not been in harmony, he said, if it had been "dissonant," the anticyclone would not have lasted so long.

Mr. Namias' study of this anticyclone and his conclusions appear in the JOURNAL OF METEOROLOGY (August).

Science News Letter, September 8, 1951

STEREOSCOPIC ATLAS—A three-dimensional kodachrome picture atlas of the human anatomy will show medical students the actual depth relationship of vessels, arteries and layers of tissue. Here Dr. David L. Bassett of Stanford University, Calif., demonstrates how the Atlas and explanatory text will be used.

ANATOMY

New Anatomy Atlas in 3-Dimensions and Colors

➤ THE FIRST phase of a complete atlas of human anatomy in three-dimensional kodachrome transparencies, each keyed to a matching diagram drawn to scale, has just been completed.

Co-authors, as it were, of this new atlas are Dr. David L. Bassett, associate professor of anatomy in the Stanford University Medical School, Calif., and William B. Gruber, research engineer of Portland, Ore.

The first section of the work covers the human central nervous system. It has taken two years to complete and will be published early in 1952.

Science News Letter, September 8, 1951

MEDICINE

Artificial Respiration By Verbal Direction

➤ GIVING VERBAL artificial respiration, or telling the patient to breathe, may be life-saving in some cases of bulbar poliomyelitis, it appears from a report by Drs. Stanley J. S. Sarnoff, James L. Whittenberger and John E. Affeldt of Boston to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 1).

One of the cases they report was a nine-year-old boy who had been doing reasonably well until early one morning when his breathing became very shallow. When he was aroused or became restless, he breathed normally, lapsing into the shallow breathing when he was quiet. He could breathe forcefully when told to do so, showing that he had full control of his breathing muscles.

The shallow breathing which did not get enough air into his lungs apparently was due to a diseased state of the breathing center in his brain. For 72 hours the nurses watched this boy carefully, reminding him to breathe whenever his breathing center "forgot" to do so. After that he was able to breathe all right on his own.

The verbal method of artificial respiration of course cannot be used unless the patient's mind is clear enough so that he can follow directions. Even then some patients will need stimulation of the phrenic nerve in the chest or brief periods in a tank respirator.

Science News Letter, September 8, 1951

AERONAUTICS

America Well Forward in Fighting Plane Quality

➤ THE QUESTION of which nation in the world has the best jet engine and the best jet plane may never be answered but records made in the recent National Air Races at Detroit by American fighting jets and bombers show that this country is well in the foreground.

More about the Russian engine that powers the MIG-15 jet fighter, and the plane itself, will soon be known by the American Air Force which now has at Wright-Patterson Air Force Base an MIG-15 plane captured fairly intact by the U. S. Navy. It is said to be the first Russian plane of the type that has been captured in good enough condition so that it can be analyzed minutely.

On the 62-mile oval closed course at Detroit, an Air Force fighter made a new world's record of slightly over 628 miles per hour, which bests the former British record of 605 miles per hour. In another run over the same course, not yet pronounced official, the American plane flew at 635 miles per hour. Other records were made by other planes.

American fighting planes taking part in the races at Detroit were standard planes with standard equipment and full combat loads, including complements of guns and rockets. Planes exactly like the new speed record holder, carrying the same armament, pilot protection and fuel tanks, are fighting in Korea today.

As stated by a retired Naval officer, the races demonstrate that the American aircraft industry has been able to give our operational forces exceptional speed, maneuverability and range—without stinting on the traditional pilot safety and high firepower characteristics of U. S. planes.

Science News Letter, September 8, 1951

AGRICULTURE

Leafy Vegetables Keep Best Near Freezing

➤ IF THE holding temperature is known, the total storage life of harvested vegetables can be predicted with reasonable accuracy.

Storage tests at controlled temperatures, made by Leonard Morris of the truck crops division of the University of California Agricultural Experiment Station at Davis emphasize the value of rapid cooling and good refrigeration for leafy vegetables continuously from harvest to purchase from the grocer's counter.

Highly perishable products like spinach and broccoli are usable for as long as 60 days when held at near-freezing temperatures. With each 18-degree rise above 32 degrees, their storage life is cut from one-third to one-half. At 68 degrees they deteriorate beyond use within two or three days.

Potatoes, however, are another story. It is neither necessary nor desirable to have low temperatures for shipping early potatoes.

Since poatoes need a warmer temperature than full icing affords, the practical solution is to permit the ice to become low or even depleted during transit.

Science News Letter, September 8, 1951

PSYCHOLOGY

Voices from Sky Cause Red Surrenders

➤ AIRBORNE LOUDSPEAKERS shouting messages to enemy troops in Korea have had spectacular effects in causing surrenders, Lt. Col. J. K. Norris of the Army's Office of the Chief of Psychological Warfare told the meeting of the Illuminating Engineering Society in Washington.

The voice from the sky offers Communist troops good treatment and good food if they surrender and stresses the superiority of the UN forces and the UN objectives in uniting Korea.

Another use for the air-borne loudspeaker is in directing refugees—in traffic control, Col. Norris said.

Science News Letter, September 8, 1951

IN SCIENCE

NUTRITION

Supply of Hog Fattener In Waste from Cities

➤ A LARGE potential supply of vitamin B-12, the famous anti-anemia and hog-fattening vitamin, has been discovered in activated sewage sludge.

The discovery is reported by Sam R. Hoover, Lenore B. Jasewicz and Nandor Porges of the USDA Eastern Regional Research Laboratory in Philadelphia in the journal, SCIENCE (Aug. 24).

Activated sludge is the more or less solid matter settling out of sewage which is subjected to the action of oxidizing bacteria in sewage treatment plants. Heretofore dried sludge has been of value only as fertilizer. Chick feeding experiments are now under way at the Department of Agriculture laboratories in Beltsville, Md., to determine whether the vitamin in the dried sludge fattens the birds the way B-12 from other sources, such as the streptomycin producing mold, fattens them.

Science News Letter, September 8, 1951

SOCIOLOGY

First-Born Child More Likely to Be a Boy

➤ THE FIRST-BORN child is more likely to be a boy than children born later.

This is probably the reason for any increase found in the ratio of the number of boys born to the number of girls born during World War II rather than a result of the greater proportion of births to young mothers.

Such are the conclusions of Dr. C. A. McMahan, sociology professor at the University of Georgia in Athens, Ga., from a study of the birth registrations in the United States during the period 1915 to 1948.

The number of males per 100 females is the sex ratio. It affects such things as the chances of getting married, the amount and extent of migration and the death rate.

The sex ratio at birth for the population of the United States is usually regarded as about 106 for whites and 103 for Negroes.

The widespread belief that the sex ratio rises in wartime or immediately thereafter because "nature" compensates for war casualties, from battle, from starvation and from other sources is evidently not so, Dr. McMahan charges. Rather, "war with its accompanying conditions does not directly affect the sex ratio at birth," he states in a report to the Milbank Memorial Fund.

Science News Letter, September 8, 1951

ENE FIELDS

MEDICINE

Cold Chemical Helps Detect Heart Murmurs

➤ A CHEMICAL familiar in nose drops used to relieve stuffiness and congestion in colds can help doctors detect heart murmurs, Dr. E. M. M. Besterman, a rheumatic fever specialist, reports in the BRITISH MEDICAL JOURNAL (Sept. 1).

When the chemical, called Neo-synephrine, is injected into the body, it slows the heart rate and at the same time increases the flow of blood and stroke volume, thus accentuating the murmur.

The heart murmur is described as an abnormal, gentle swishing sound caused by a damaged heart valve. It is often the only sign of heart damage, as in rheumatic fever, but in the early stages may be so faint as to go undetected.

Science News Letter, September 8, 1951

INVENTION

Improve Process to Get Natural Gas Carbon Black

➤ CARBON BLACK, an essential in the manufacture of automobile tires and used for many other purposes, is made from natural gas by an improved process which brought patent 2,564,736 to Charles A. Stokes, Wellesley Hills, Mass. Godfrey L. Cabot, Inc., Boston, has acquired the patent rights by assignment.

The process is characterized by burning streams of natural gas and oxygen, or a mixture of natural gas and oxygen, in a combustion chamber containing no air. The result is a larger yield of carbon black than obtained by older methods, and also the production of a synthesis gas that can be converted into liquid fuels.

Science News Letter, September 8, 1951

TECHNOLOGY

Nitric Acid Subsitutes for Sulfuric, Relieving Shortage

➤ RELIEF FROM the present world-wide shortage of sulfur and sulfuric acid is promised with processes for making fertilizer with plentiful nitric acid. Some four million tons of sulfuric acid have been used each year in the United States to make superphosphate fertilizers.

The shortage of sulfur and sulfuric acid is currently the most acute one facing the chemical industry, chemically-based industries and agriculture, the Soil Science Society meeting in State College, Pa., was told by Dr. Eugene D. Crittenden of Allied Chemical and Dye Corporation, New York.

The Tennessee Valley Authority, he said, has done extensive pilot plant work on nitro-phosphate processes and on agronomic testing of the product. The most successful processes studied by this organization were those using nitric acid in admixture with either sulfuric or phosphoric acid. The product, after granulation and drying, is reported to have good storage properties and to give excellent results in crop-growing tests.

Substitution of nitric for sulfuric acid will require alterations in the whole technology of superphosphate manufacture, he stated. The alterations include equipment, processing methods and product finishing steps. More extensive equipment is needed for finishing nitro-phosphate products than in producing ammoniated superphosphates or ammoniated complete fertilizers.

Science News Letter, September 8, 1951

OCEANOGRAPHY

Find Flat-Top, Mile-High Mountain Mile Below Sea

➤ A MILE high mountain whose flat top three miles wide is buried a mile beneath the surface of the northern Pacific has been discovered by an oceanographic expedition aboard the Horizon, vessel of the Scripps Institution of Oceanography at La Jolla, Calif.

Christened "Holiday Seamount" it is located at 55 N and 143 W. Holiday is a sea area on which little information is available and seamount is the term for a flat-top isolated mountain beneath the sea.

Science News Letter, September 8, 1951

TECHNOLOGY

Facsimile Transmission of News to be Tried in Japan

➤ THE FACSIMILE system of transmitting exact copies of printed pages, written items, photographs and charts by wire or radio will be used in Japan by a central news agency to distribute daily items to its newspaper subscribers.

The teleprinter system, in general use throughout the Western World, is not satisfactory in Japan and China because of the complicated characters used in writing. With the use of facsimile, perfect, complete copies in eastern characters will be received by the newspapers.

The Japanese News Agency, which specializes in economic and financial news, has been granted an exclusive license under the Hogan facsimile patents in Japan, Formosa, Korea and Okinawa, it was announced in New York by John V. L. Hogan, president of Faximile, Inc.

Equipment will also be made available for other uses, Mr. Hogan stated. Units have already been shipped to the Japanese National Rural Police for installation on its radio communications network.

Science News Letter, September 8, 1951

GEOLOGY

Diamonds Found All Over U. S. But Chances Are Slim

➤ YOU COULD pick up a diamond from the ground out walking almost anywhere in the United States, but the chances are against it. And the chances that such a find would lead you to a valuable diamond deposit are extremely slim.

Geological conditions ages ago apparently just were not right for the formation of diamonds in the United States. Nevertheless, diamonds have been found in several states — California, Indiana, Kentucky, North Carolina, Texas and West Virginia among others.

The only state, however, where a diamond has been found in the place where it was formed is Arkansas. An Arkansas diamond as well as those from other states mentioned is among the diamonds now in the gem collections of the Smithsonian Institution in Washington.

Diamonds found in the U. S. do not fit into any pattern. The great majority of them have been in glacial drift, brought in one of the huge ice masses that covered most of the northern half of the country at one time. Others have been picked up in the mud and debris deposited by rivers.

Science News Letter, September 8, 1951

AGRICULTURE

Artificial "Sun" Gives More Eggs, Lambs and Flowers

➤ ARTIFICIAL "SUNS" can help the United States produce the food required to maintain our present standards of living, Dr. Byron T. Shaw, deputy administrator of the U. S. Department of Agriculture's Agricultural Research Administration has stated.

Electric lamps, producing radiations in the visible, the ultraviolet and the infrared will continue to play an increasing role in many branches of agriculture he told members of the Illuminating Engineering Society meeting in Washington. Hens kept entirely out of the sunlight but continuously exposed to ultraviolet light have laid from 10 to 19 per cent more eggs, Dr. Shaw pointed out, than hens kept under the same conditions but without ultraviolet lights.

Lambs for market might be more plentiful if the sheep breeding season could be lengthened. Restricting light received by females to only six hours a day may do just that, Dr. Shaw said.

Because plants respond to a definite day-night cycle, breeders have been able to speed up flowering of plants used in crop breeding to grow two or more generations in one year, instead of just one. It is this response to light and dark, Dr. Shaw noted, that makes it possible for chrysanthemum growers to have flowers in bloom for football games or special holidays.

Science News Letter, September 8, 1951

MEDICINE

Yellow Jack Is Still Threat

On hundredth anniversary of Major Walter Reed's birth, Pan American health expert says U. S. not cooperating in eradicating mosquito which carries yellow fever.

By WADSWORTH LIKELY

➤ LATIN AMERICAN nations want the United States to join them in eradicating from the Western Hemisphere the mosquito which can carry yellow fever, but the United States has not cooperated. This is what Dr. Fred L. Soper, director of the Pan American Sanitary Bureau, says on the 100th anniversary of the birth of Major Walter Reed, Sept. 13.

Major Reed was the man who first conclusively demonstrated that the dread "yellow jack" is spread by a mosquito. This was accomplished in 1900 in Cuba by dramatic experiments with human volunteers.

"Jungle" yellow fever still lurks as an animal and human disease in the interiors of Latin America and Africa, ready to come out, according to Dr. Soper, as a strictly human disease so long as the mosquitoes are permitted to remain in the cities. The particular mosquito which is the villain is the female of the *Aedes aegypti*, prevalent in this country in coastal regions from Norfolk, Va., down and around the coast to Brownsville, Tex., on the Gulf of Mexico and as far north as Oklahoma.

The 21 American Republics, including the United States, have been committed since a Pan American Health Organization meeting in Caracas in 1947 to the complete eradication of the yellow fever mosquito. Failure of the United States to begin sweeping *Aedes aegypti* from its own country has caused considerable comment and criticism among the health officers of other countries, according to Dr. Soper.

U. S. Public Health officials point out that there has been no case of yellow fever in the United States for about 25 years and no outbreak of the disease since 1905. To be dangerous, the mosquito needs a person with yellow fever to feed on. Thus, what might have meant death or sickness 50 years ago, is only the annoying prick of a mosquito today.

This is one of the reasons why American officials see little need to wipe out entirely the *Aedes aegypti* mosquito. Although Dr. Soper says that the cost of wiping out the mosquito has gone down since the advent of DDT and the job could probably be done in three to five years, the Public Health Service believes that the cost would be prohibitive. They point to the need to spend funds on other more pressing problems, polio for one.

With yellow fever vaccine and DDT, they say, any outbreak could be wiped out almost the instant it appears.

Furthermore, public health in this country is a sort of "states rights" affair. Any comprehensive campaign to wipe out the mosquito would have to be approved and administered by the public health officer of every state in which the mosquitoes exist.

Nevertheless, other nations of the world still worry about yellow fever. Last year, the World Health Organization brought up-to-date its delineation of the two zones of prevalence of the yellow fever virus in the tropical belts of the Americas and Africa.

According to this revision, the endemic yellow fever area in Africa is limited in the north by a line from the mouth of the Senegal River in French West Africa to Eritrea, except for the port of Massawa. The 18th parallel is the southern limit of yellow fever, enclosing part of Angola in the west, the major part of the Belgian Congo and all of Kenya in the east.

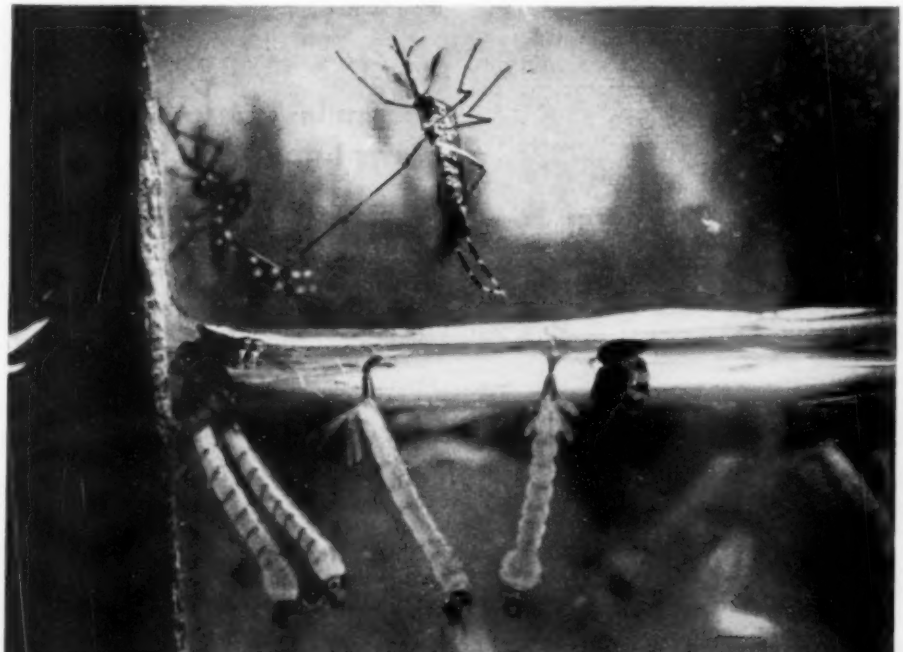
In the Western Hemisphere, the endemic zone comprises Venezuela, Colombia, the British, Dutch and French Guianas, and parts of Brazil, Peru, Boliva and Ecuador, but excludes certain northern ports and Manaos, in Brazil.

Brazil has led the way in the eradication of the mosquito carrier from its vast territory and now no centers of infestation are known inside its borders.

Continuing Campaign

Despite what the World Health Organization says, Dr. Soper, whose speciality has been yellow fever, believes that yellow fever may be present quite extensively from time to time in jungle animals, with some human cases, from southern Mexico to as far south as northern Argentina, Paraguay and southern Brazil. Recent cases have been diagnosed in Panama and Costa Rica, and evidence of the disease in animals has been found in southern Mexico. Only a continuing and vigorous campaign against *Aedes aegypti*, he believes, will safeguard the Western Hemisphere from future outbreaks of yellow fever.

Nevertheless, the picture today is quite different than it was 100 years ago, when Walter Reed was born in a little town in Virginia. Epidemics raged in North American cities. Reed himself estimated that between 1793 and 1900 there were at least half a million cases of yellow fever in the United States, with 100,000 deaths.



***MOSQUITO'S LIFE STAGES**—Shown here are the three stages in the development of Aedes aegypti, the female of which carries yellow fever. The long white things below the water line are in the larvae stage; the dark round object below the surface is a pupa, and the full-grown female mosquito is shown above the surface of the water.*

Although we now know that *Aedes aegypti* becomes sluggish and dies in cold weather, the disease extended, during the summer, as far north as Montreal in Quebec and Portsmouth, N. H.

One of the worst of the early outbreaks was in Philadelphia in 1793 when, it is estimated, 10 per cent of the population was killed off. People fled in panic from the city. Dr. Benjamin Rush, a signer of the Declaration of Independence, and a foremost physician of his day, worked long and hard, but of course in vain, against yellow fever. The epidemic died out with the coming of cold weather and the death of the mosquitoes. But the connection was not made, even though Dr. Rush wrote, as an incidental remark, that mosquitoes were uncommonly numerous that summer.

Besides the deaths, millions of dollars of property were lost in every epidemic. This was because the prevailing theory had it that yellow jack was transmitted by fomites—black vomit and excrement of the victims—and by the clothes they wore and the things they touched. Bedding and furniture—everything that had come in contact with a yellow fever patient—was burned. The disease continued to spread.

In 1881, a Havana physician, Dr. Carlos Finlay, wrote a paper in which he announced his belief that the disease was carried by a mosquito—and he named it—the mosquito which we now know as *Aedes aegypti*. The medical profession had respect for Dr. Finlay but, they believed, here he had gone wrong.

Walter Reed and his colleagues, of course, proved him right. Reed's work was preceded by much good research, notably that of Surgeon General George M. Sternburg, which disproved a mistaken theory about the disease, and Dr. Henry R. Carter, U. S. Public Health Service, who noted that two or three weeks elapsed between the first and second cases of a disease outbreak.

Human Guinea Pigs

Yet the world will always remember the brilliant and systematic demonstration carried on by Reed which demonstrated that the female of the *Aedes aegypti* carried the disease from man to man. The world came near forgetting the human guinea pigs who volunteered to be bitten by mosquitoes or to live in contact with fomites. It was only in the late 1920's that the survivors of the experiment were given adequate pensions by Congress.

Since Major Reed's day, the battle against yellow fever has gone on. First announcement of a successful vaccine came in 1932, from scientists at the Rockefeller Institute. But complications developed in the methods of preparing it and it was not until well after World War II began that the vaccine was foolproof. From that time on, all servicemen going into yellow fever zones were vaccinated.

Major Reed's work not only meant victory over yellow fever—it also pointed the way to the conquest of malaria, particularly in the Panama Canal Zone. And it opened a new era in preventive medicine, an era of protection against the insects which carry diseases to man.

Science News Letter, September 8, 1951

ENTOMOLOGY

Watching Insects to Time Proper Control Saves Money

➤ A UNIQUE method for controlling cotton and alfalfa pests has been developed by Ray F. Smith, professor of entomology, University of California College of Agriculture at Berkeley.

He calls it "supervised control," and it means money in the bank for the farmers because it cuts costs of insecticides and labor.

This is how it works:

Several growers in an area hire trained entomologists to make field surveys for insect pests. Each field is visited about once a week. From the numbers of insects found in the fields, the best time for control measures can then be figured. Each recommendation is tailored to fit the needs of the individual field. The grower gets better results by applying insecticides only when actually necessary.

More than 85,000 acres of cotton and 15,000 acres of alfalfa are now being handled in California under "supervised control." This is the sixth year of its operation.

Science News Letter, September 8, 1951

Listen to this Record!

CORTINA

SPEAK FRENCH-SPANISH

RUSSIAN-GERMAN
ITALIAN-BRAZILIAN-JAPANESE

"Learn by Listening" to CORTINA RECORDS—NEW RECORDINGS, UNBREAKABLE RECORDS. Learn at home, the NATURAL way—quickly, easily, cheaply.

Only 15 Minutes a Day!

THOUSANDS have found it the most fascinating, most effective way to learn languages for Pleasure, Business, Travel, Culture. INVESTIGATE!

Send For FREE BOOK!

Illustrated 32-page book, "The Cortinaphone Short-Cut" sent FREE. Tells just what you want to know. Interesting. Get it!

Write Today--NOW

CORTINA ACADEMY (Est. 1882)
Suite 609, 105 W. 40 St., N. Y. 18, N. Y.

Please send me—without obligation—your free book. I am interested in (check)

☐ French ☐ Spanish ☐ German ☐ Italian ☐ Brazilian ☐ Russian ☐ Japanese

Name.....
Address.....
City.....State.....

☐ VETS! CHECK HERE IF NOW ELIGIBLE UNDER G.I. BILL.

WAR SURPLUS BARGAINS

35 POWER ERECTING MICROSCOPE

AMAZING CLARITY

"All-Position" Universal Mount

Greater Versatility

Gives You 3" of Working Space from Objective to Platform . . .

A remarkable Instrument! Exceptional Value! Prism Erectors give you an erect image—exactly as your eye sees it, not upside-down as in an ordinary Microscope. Ramsden Eyepiece permits fine precision focusing. 3-Element color corrected objective—1" diameter. Microscope body is of brass with black crackle finish. Working distance from objective to object is 3", which permits any work, dissection, tooling, etc. to be carried on "under power" while looking through Microscope. The instrument is 6½" long with base 7"x9". Only because we were able to utilize some war surplus parts are we able to offer such a fine Optical Instrument—easily worth $75.00—at this special low price.

Stock No. 970-Q.....$29.50 Postpaid

BINOCULAR BARGAINS—American Made! Brand new! Finest Grade! Light-weight, dust-proof, moisture-proof, expertly collimated. Optics low reflection coated. Sturdy Carrying Case included. Guaranteed!

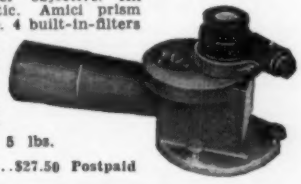
Stock #963-Q	6x30	$75.00 Postpaid
Stock #964-Q	7x35	85.00 Postpaid
Stock #965-Q	7x50	98.50 Postpaid
Stock #966-Q	9x50	99.50 Postpaid

(Be sure to add 20% Fed. Tax on Binoculars)

8 POWER ELBOW TELESCOPE

Gov't. Cost $200.00! Our Price $27.50!

Big 2" diameter objective. All lenses Achromatic. Amici prism erects the image. 4 built-in-filters—clear, amber, neutral and red. Slightly used condition but all guaranteed for perfect working order. Weight 5 lbs.



Stock #943-Q. ..$27.50 Postpaid

TERRIFIC BARGAIN! BUBBLE SEXTANT

BRAND NEW and with Automatic Electric Averaging Device and Illuminated Averaging Disc for night-time use. Govt. cost $217. Though brand new, we have re-checked Bubble and Collimation and guarantee perfect working order. Price includes wooden Carrying Case. Full directions for use accompanying each shipment.

Stock #933-Q.....$22.50 Postpaid

TELESCOPE EYEPIECE—Consists of 2 Achromatic Lenses, F. L. 20 mm. in a metal mount.

Stock #5140-Q..... $4.50 Postpaid

SIMPLE LENS KITS! Kits include plainly written, illustrated booklet showing how you can build lots of optical items. Use these lenses in experimental optics, building TELESCOPES, low power Microscopes, etc.

Stock #2-Q—10 lenses.....$ 1.00 Postpaid
Stock #5-Q—45 lenses.....$ 5.00 Postpaid
Stock #10-Q—80 lenses.....$10.00 Postpaid

PRISMS! PRISMS! PRISMS!

We have the world's largest stock, widest variety, at the lowest prices. Write for our FREE Catalog Q.

SLIDE PROJECTOR SETS—Consist of all unmounted lenses you need to make the following size projectors:

Stock #4029-Q—35 mm.....$2.85 Postpaid
Stock #4038-Q—2¼" x 2¼".....$3.35 Postpaid
Stock #4039-Q—2½" x 3½".....$3.35 Postpaid

We Have Literally Millions of WAR SURPLUS LENSES AND PRISMS FOR SALE AT BARGAIN PRICES. Write for Catalog "Q"—FREE!

Order by stock No. Send Check or M.O. Satisfaction Guaranteed!

EDMUND SCIENTIFIC CORP.
BARRINGTON, NEW JERSEY

PSYCHOLOGY

Some People Like Having Acidents

➤ SOME PEOPLE seem to like to have accidents.

C. A. Oakley, lecturer in industrial psychology at Glasgow University in Glasgow, Scotland, in a report suggests others in accidents have troubled consciences and actually get involved in accidents as self-punishment.

People who seem to like attention, Mr. Oakley believes, may want to win sympathy or gain attention, even though they do not have the accidents deliberately.

Most factory accidents happen to comparatively few workers. About 80 per cent of the factory accidents can be attributed just to somebody having made a mistake.

Tidiness and slow work do not necessarily mean a good safety record, Mr. Oakley says. The exceptional worker is not usually noted for his orderliness. The able man who takes chances knowingly is not necessarily prone to accidents. Rather it is the less able man who has the accidents when he tries to copy the better worker. And slow, ponderous workers often have bad accident records.

Science News Letter, September 8, 1951

LET **Max Born** EXPLAIN MODERN PHYSICS TO YOU

Let Max Born, the world-famous contributor to quantum mechanics (and one of the most entertaining of all science writers), explain to you the workings of electrons and ions, cathode rays, invisible light, Bohr's theory of spectral lines, wave mechanics, electronic structure of the atom, Pauli's exclusion principle, magnetons, nuclear physics and many other "mysteries" of modern physics that you have always wanted to learn more about. The new, revised and expanded 1951 edition of "THE RESTLESS UNIVERSE" contains Born's science credo plus brilliant study of stellar energy, Heisenberg's uncertainty principle, and other advanced concepts.

See Atoms in Action

With the book's 7 unique "movie sequences" you can watch electrons, atoms and molecules in action. Flip the pages and you'll see hundreds of cleverly integrated drawings reveal gas molecules reacting to pressure, motion of electron in hydrogen atom, scattering of alpha particles, etc. Almost 1000 illustrations. Enclose check or M. O. for only $3.95 with name and address (or clip convenient coupon below) for your copy of "THE RESTLESS UNIVERSE." Return book in 10 days if you don't agree it's clearest, most fascinating, best illustrated introduction to modern physics in print. Only 1250 copies available so mail TODAY!

120 drawings and diagrams. 11 pages of photographs. 7 "movie" sequences. Nearly 1000 illustrations altogether, 325 pp. 6¼ x 9¼.

DOVER PUBLICATIONS,
Dept. 26, 1780 Broadway, N. Y. C. 19, N. Y.
Send postpaid books checked below:
....RESTLESS UNIVERSE ($3.95)
....FREE science catalog
UNCONDITIONAL GUARANTEE: Return books in 10 days for full cash refund if unsatisfactory.

NAME .....

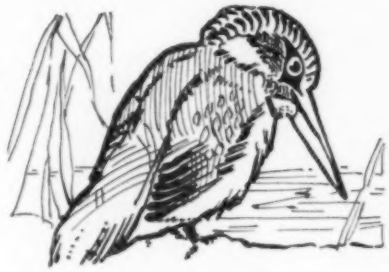
ADDRESS .....

.....

I'm enclosing $.....in full payment.

ORNITHOLOGY

NATURE RAMBLINGS



Kingfisher

➤ LATE SUMMER brings a relative silence in avian musical circles, and we are apt to forget about the birds, or to think they have already gone away.

Nevertheless they are still here, only now like well-behaved children of a past generation they are to be seen (if you look sharp) and not heard. The summer bird observer still uses his ears, but his eyes have a larger proportion of the work to do than they had in April and May.

An easy object for this "birding by eye" is the kingfisher. He is no shy lurker in coverts, nor does he camouflage himself in mottled brown or gray to blend into a tree-top or dry pasture background. He shines boldly in enamel colors and sits out on a jutting stump over the water where anybody can look.

He's not there for the purpose of getting himself admired, of course. He is doing some looking himself—looking for his dinner. For the kingfisher is a fisher in fact as well as in name, and as patient and motionless while waiting for his quarry as St. Izaak Walton could wish the best of his featherless worshippers to be.

Silently he sits there for many minutes, until a fish of a size he thinks he can handle swims within range. Then, literally a blue flash, he dives. A white splash, and the kingfisher emerges, the captured fish in his strong beak. It is seldom that this living fish spear misses.

The kingfisher does not confine his diet entirely to fish. Crayfish, frogs, even large beetles and other insects, all find their place in his larder. One or two species of kingfisher even do considerable foraging in the woods, for the more usual insect prey of other birds.

Due to his occupation, the kingfisher must be a solitary. Fishing is not a gregarious occupation. And being solitary, the kingfisher is also jealous. He marks out a pretty well-defined preserve of his own and will fight any other kingfisher he catches trespassing.

The kingfisher species most common in this country is one of the most wide-ranging and adaptable of all birds. It is found over almost the whole of the North American continent and in northern South America as well. It breeds as far north as the Mc-Kenzie river basin, and in winter flies as far south as the Orinoco.

The kingfisher strikes one as a possible cousin to the woodpecker, what with his crest, his powerful bill and his stiff tail-feathers. It is not surprising, then, to learn that he really is a relative of our drummers on hollow trees, being put into the same zoological group by the scientists.

Like the woodpecker, the kingfisher builds his nest in a burrow, only he digs the burrow into the bank of a creek instead of into the wood of a dead tree.

Science News Letter, September 8, 1951

INVENTION

Plug-in Radio Fire Alarm Gives Low-Cost Protection

➤ NO COST for special wiring is involved in an improved radio-operated fire alarm system for factories, farm buildings and private residences which was recently awarded a patent. It uses equipment merely plugged into the electrical lighting system.

The system includes as many signal transmitter units as may be required for placement in places where fire may occur, and a receiver-alarm unit which is placed in a central position. Transmitters and the receiver are plugged into the ordinary lighting current and are activated by this current. The carrier signals created are transmitted over the wires of the electric light system.

The transmitter signal units are so constructed that they are made operative by an excessive rise in temperature such as from a blaze soon after it starts. They utilize a self-contained thermostat and a vacuum tube oscillator.

Inventor is Donald P. Decker, Belmont, Mass. His award is patent 2,566,121. He claims his system provides as good protection as the more expensive wired-in types of central station systems and is more reliable than local alarms operated by clockwork mechanism or batteries.

Science News Letter, September 8, 1951

HOUSES OF EARTH

The ground you stand on is your best building material. Easy to build—insulated against heat and cold. Ratproof—Soundproof—Termiteproof and Fireproof. Book based largely on findings of the Bureau of Plant Industry, Soils and Agricultural Engineering. Low Building and Upkeep costs.

No priorities on dirt.

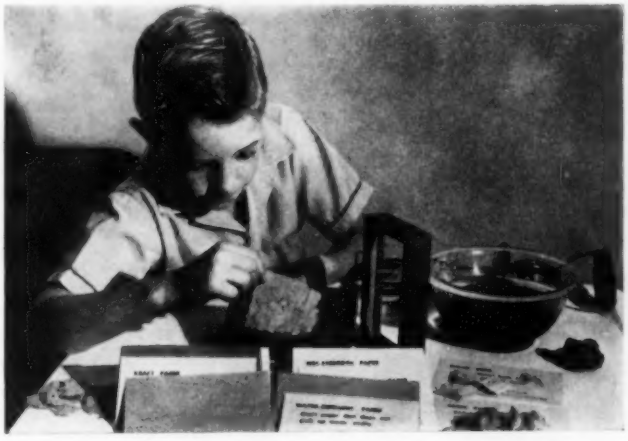
42-page booklet containing complete building instruction and 18 illustrations. Mailed upon receipt of $2.00. Add postage foreign orders.

A B. LEE
Box 171-Ben Franklin Station
Washington, D. C.

See the INSIDE of the SCIENTIFIC REVOLUTION!

Things of science Will Bring You Monthly "Magic" from the Laboratories of Man and Nature — New Memberships Can Now Be Accepted

NEW FABRICS . . . TASTE-ENHANCERS . . . SLIDE RULE . . . SEA SHELLS . . . WETTER WATER . . . BASIC CHEMICALS . . . COLOR VISION . . .



MAN TAKES COAL, AIR AND WATER — AND MAKES CLOTH . . . MAKES SOAPLESS SOAP . . . MAKES PLASTICS TO REPLACE METAL, WOOD AND FIBER . . . MAKES DISAPPEARING THREAD

WHAT DO they look like, these strange and exciting products, made by scientific man—or taken from Nature's own laboratory? Now you can see for yourself!

Membership in THINGS of science will bring you each month a scientific surprise package, packed with new or unusual items of science. By yourself or with a group you will perform fascinating experiments and demonstrations—the essential materials are furnished in your THINGS box.

Accompanying the THINGS of science unit in its blue box will be a folder of clear instructions and absorbing, authoritative background information. You will also receive museum-type cards for displaying each item in the kit. Thus, in a short time, you will build up an extensive and unique little science museum of your own. Here are scientific fun, valuable knowledge, mental stimulation, hours of absorption, future hobbies!

The response to THINGS of science—begun several years ago by Science Service—was so (embarrassingly) enthusiastic that it was a problem to keep up production of units with the demand for membership. We have now successfully arranged for increased production to accommodate a limited number of new members. Because Science Service is a nonprofit institution devoted exclusively to spreading scientific knowledge, membership dues in THINGS of science are extremely modest. $5.00 a year bring you 12 challenging, engrossing kits from the world of science.

You are urged to mail promptly the application form and your remittance so that you can be enrolled before the quota for the next unit is filled.

THINGS of science makes a delightful gift for intelligent youngsters or inquiring adults. You may present gift-memberships —a unique and valued remembrance— and thus sponsor the spread of scientific enlightenment in this prolific age of new wonders.

THINGS of science
Washington 6, D. C.

TO: SCIENCE SERVICE, 1719 N St., N.W.,
Washington 6, D. C.

Enclosed find ☐ $5.00 ☐ $10.00

☐ Please enroll me in THINGS of science.

My Name _____

Street _____

City & State _____

☐ GIFT—Please enroll in THINGS of science:

Print Name _____

Street _____

City & State _____

9-8-51

MEDICINE

New Chemical Aids Treatment of Shock

➤ SURGEONS HAVE a new aid for the treatment of shock. It is a chemical known as l-arterenol or l-nor-epinephrine and also by the trade name, Levophed.

This chemical is related to epinephrine, or adrenalin, and like epinephrine, it raises blood pressure. It has the advantage that it constricts blood vessels without causing any significant change in the heart's output. Its action is "prompt, predictable and easily controlled," Drs. Norton M. Luger, Allen Kleiman and Rudolph E. Fremont of the Veterans Administration Hospital at Staten Island, N. Y., report.

It proved lifesaving in the case of their patient, a 73 year old man with a perforated stomach ulcer. The patient was in such profound shock when brought to the hospital that he could not be operated on. The shock state was rapidly relieved by the drug, so that an operation could be performed and the rupture of his stomach closed.

"The patient has had a satisfactory recovery," the doctors report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 25).

They warn against using the drug until the cause of shock has been learned, as it might aggravate a concealed hemorrhage.

"Excellent" results with this same drug in 50 operations including nerve cutting operations in the spine and head regions, as well as abdominal, chest and gynecological operations are reported by Dr. William A. Shafer of Bluefield Sanitarium, Bluefield, W. Va., in the West Virginia MEDICAL JOURNAL.

The drug has been "extremely efficacious," Dr. Shafer reports, in cases of spinal anesthesia in which there is a drop in blood pressure.

Science News Letter, September 8, 1951

YOUR
HAIR
ITS HEALTH, BEAUTY, AND GROWTH
By HERMAN GOODMAN, M.D.

A medical specialist tells you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as: Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene—glands—diet—hair coloring—and myriad other subjects concerning hair.

"Discusses the many problems of hair retention, regrowth and removal."—Science News Letter.

287 pages—PROFUSELY ILLUSTRATED!
Price $2.95, incl. postage, 5-day-Money-Back Guarantee

EMERSON BOOKS, Inc., Dept. 957-F
251 W. 19th Street, New York 11

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

BASIC THEORIES OF PHYSICS: Heat and Quanta—Peter G. Bergmann—*Prentice-Hall*, 300 p., $6.70. For graduate students.

THE CHEMICAL TECHNOLOGY OF DYING AND PRINTING, Vol. II: Substantive, Basic, Acid, and Pigment Colors, Aniline Black, and Dyestuffs for Acetate Rayon and Synthetic Fibers—Louis Diserens—*Reinhold*, 446 p., $12.00. Translated and revised from the second German edition.

COLLECTION AND BURNING OF LOCOMOTIVE CINDERS—E. J. Boer, J. M. Allen, and B. A. Landry—*Bituminous Coal Research, Inc.*, 8 p., paper, 20 cents. Results of the continuing tests of the Norfolk and Western Railway Co. and Bituminous Coal Research, Inc.

ELEMENTARY SCHOOL SCIENCE AND HOW TO TEACH IT—Glenn O. Blough and Albert J. Huggett—*Dryden Press*, 532 p., illus., $5.25. The teacher who has to be a "jack-of-all-trades" in the scientific courses will welcome this handy teaching guide.

A GUIDE TO BIRD FINDING EAST OF THE MISSISSIPPI—Olin Sewall Pettingill—*Oxford University Press*, 659 p., illus., $4.00. Bird-watchers will appreciate this geographical locater.

HEALTHY BABIES: A Complete Handbook for Modern Mothers—Josephine H. Kenyon and Ruth K. Russell—*Little, Brown and Co.*, 5th ed. revised, 317 p., 3.00. This new edition includes the latest developments in the field and also presents new material on the child who is slow to develop.

HOW TO KNOW THE AMERICAN MAMMALS—Ivan T. Sanderson—*New American Library*, 170 p., illus., paper, 35 cents. All American mammals from whales to mice, the one that walks on water to the one that inspired the Mermaid myth are included.

IMPROVING OFFICE PLANNING AND CONTROLS: Office Management Series No. 128—*American Management Association*, 40 p., paper, $1.25. Includes articles on manpower budgeting control, office operations budget, protecting records in time of war, etc.

MAJOR ACTIVITIES IN THE ATOMIC ENERGY PROGRAMS, January-June 1951—U. S. Atomic Energy Commission—*Govt. Printing Office*, 151 p., paper, 35 cents. A reprint of the AEC 10th semiannual report.

NATURAL RUBBER AND YOU—*Natural Rubber Bureau*, 28 p., illus., paper, free upon request to publisher, 1631 K Street, N. W., Washington, D. C. Interesting facts and statistics on this material, vital in both peace and war.

PATTERNS IN THE SKY: The Story of the Constellations—W. Maxwell Reed—*Morrow*, 125 p., illus., $2.50. Children can find here the 25 most familiar constellations with interesting facts about each one. Charts appear in pairs, one showing the ancient drawings of heroes and animals, the other the actual constellation.

PHYSICAL EDUCATION FOR CHILDREN OF ELEMENTARY SCHOOL AGE—National Conference on Physical Education for Children of Elementary School Age—*Athletic Institute*, 47 p., paper, 50 cents. A guide for the improvement of physical education programs.

PUNCHED CARDS: Their Applications to Science and Industry—Robert S. Casey and James W. Perry, Editor—*Reinhold*, 506 p., illus., $10.00. Individual scientists, engineers or other technologists can use this information to solve their individual problems. Particular emphasis is on hand sorted cards.

THIRTY-FIFTH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS, 1949—*Govt. Printing Office*, 684 p., illus., $5.50.

Science News Letter, September 8, 1951

MEDICINE

Cancer Three Times as Likely If Mother Had Breast Cancer

➤ WOMEN ARE three times as likely to develop cancer if their mothers had breast cancer.

This finding, from a study of 1,488 cases of breast cancer, is reported by Dr. Dryden Phelps Morse, Columbia University School of Medicine, in the professional journal of the American Cancer Society, CANCER.

Science News Letter, September 8, 1951

Plant Nutrient Tablets
. . . for Plant Culture

Each tablet contains one gram of a nutrient. Saves the time required for weighing out each ingredient for each experiment.

For experiment stations, hydroponics, high school and college classes in botany, etc.

Write for leaflet PN-SNL

Cargille Scientific Inc.
118 Liberty St. New York, N. Y.

VACUUM PUMP

All Metal Jet pump of 1001 uses. Vacuum of 0-29" Mercury. Has anti-splash head and reversible flow. Screws on standard water faucet (adapter for smooth faucet 1.00 additional). Vacuum nipple has ¼" hose connection. Five day trial money-back guarantee. COD if desired plus postage or Prepaid if remittance of 1.98 inclosed. Dealers solicited. $1.98 POST-PAID.

NATIONAL LABORATORIES
11800 S. E. Linwood Ave., Portland 22, Ore.

RADIO

Old Bulbs and New Tubes

Bands of interference across center of television set may be due to an old-fashioned light bulb. Fluorescent lamp causes radio noise.

➤ IF YOUR television set has a band or two of interference across the middle of the picture, an old-fashioned light bulb may be the trouble-causer. And if your radio gives out with a low pitched buzz, the culprit may be a fluorescent lamp.

These reasons for TV intereference and radio noise were suggested to members of the Illuminating Engineering Society meeting in Washington.

The straight wire incandescent lamp—it has not been manufactured for home use since 1925—can cause interference patterns on a TV set as far as two city blocks from its location, Harry E. Schultz and Delmar D. Kershaw of General Electric Company, Cleveland, said.

There are about a million of these lamps scattered around the country. They can be spotted by the clear glass bulb, by a very pointed tip at the top of the bulb and by the filament shape. They are used mainly in attics, closets, fruit cellars, etc., where they are turned on only infrequently and usually only for short times, so that pinpointing the interference source is very difficult. Since modern light bulbs do not interfere with TV reception, the old fashioned lamps are often overlooked, the engineers stated.

The patterns on a TV picture caused by intereference from straight wire incandescent lamps are typical and do not look like those caused by small motors, shavers or automobile ignition systems. They do resemble the intereference patterns given off by diathermy machines or other similar high frequency equipment manufactured before 1947.

The main channels affected are 2, 3 and 4, since the lamps produce oscillations in the frenquencies used for these channels. The lamps will also interfere with the sound portion of the program. Recommended solution: "Find and replace the guilty lamp."

Radio noise falls into two general classes, J. Warren Culp of Sylvania Electric Products, Inc., Bayside, N. Y., told the engineers. One type is caused by gaseous discharges, such as atmospheric lightning, electric motors and the sustained discharge that is found in neon signs and fluorescent lamps.

The other type is caused by diathermy machines, television receivers and occasionally incandescent lamps, he said.

"Radio noise due to radiation from electrical wiring," Culp reported, "can be effectively eliminated by well known methods but radiation from a fluorescent tube cannot be prevented so easily, since the ionized gas in the tube acts as a transmitting antenna."

Science News Letter, September 8, 1951

MEDICINE

Blood Tests for Cancer Disappointing

➤ FOUR BLOOD chemical tests for cancer, hailed within the past four years as very promising for earlier detection of cancer, are termed not accurate enough as diagnostic tests for cancer in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 1).

The report is by Drs. Richard J. Henry, Sam Berkman, Marshall S. Little and Richard J. Winzler of the University of Southern California, Los Angeles.

One of the tests, a mucoprotein test, was developed by Dr. Winzler. The other three were the methylene blue and heat turbidity tests of Dr. M. M. Black of Brooklyn, N. Y., and the iodoacetic test of Dr. C. Huggins of Chicago.

Each of 226 patients was given all four tests. None of the patients was so sick he had to be in bed and therefore none presumably had very far advanced cancer.

Of the 226 patients, 77 were known to have cancer while 149 did not have it. The persons making the tests, however, had no knowledge of the patients' case histories.

The tests gave correct results in only about 60 to 70 per cent of the cases, the four scientists report, "and thus cannot be regarded as accurate diagnostic tests for cancer."

Even when the four tests are run as a battery, and interpreted as positive if at least two individual tests are positive, the results are not much more accurate.

Science News Letter, September 8, 1951

● RADIO

Saturday, Sept. 15, 1951, 3:15-3:30 p. m. EDT
"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Rear Admiral Calvin N. Bolster, chief of the U. S. Navy's Office of Naval Research, will discuss "Research Pays Off for Defense."

EXAKTA "V"
35mm Single Lens Reflex Camera

One lens both for viewing and picture taking assures perfect sharpness, accurate exposure, maximum depth of field, and correct composition for color. You always see the exact image before you take the picture—whether the subject is an inch or a mile away, whether it is microscopic or gigantic, whether it is moving or stationary. Instantly interchangeable lenses permit telephoto, wide angle, close-up, copy and microscope photography. **With f3.5 Zeiss Tessar "T" Coated Lens .....$180.00 plus tax**

Write Dept. 900 For Free Booklet "I"

NATURE PHOTOGRAPHY WITH MINIATURE CAMERAS by Alfred M. Bailey (Denver Museum of Natural History). This eminent explorer and scientist displays his finest Exakta photographs and others along with explanatory material. 35 full page photographs. 64 pages 50c

EXAKTA CAMERA CO., 48 W. 29th St., New York 1, N.Y

IT'S LIKE HAVING NEW EARS!

A Miracle to HEAR AGAIN So Clearly ... So Easily!

The wonder of it! *NO BUTTON SHOWS IN MY EAR,* yet I hear even whispers so distinctly it's like having a brand new pair of ears. No effort—no straining; I just relax and *HEAR,* thanks to an amazing new "electronic ear" recently perfected by a noted Chicago inventor. You can read all about it in a FREE BOOK that's good news for every hard of hearing person. Mail the coupon today for your FREE copy.

ACCEPTED COUNCIL ON PHYSICAL MEDICINE AMERICAN MEDICAL ASSOCIATION

Beltone
MONO-PAC One-Unit Hearing Aid

Beltone Hearing Aid Co., Dept. 356-C
1450 W. 19th St., Chicago 8, Ill.

MAIL COUPON FOR FREE BOOKLET

Beltone Hearing Aid Co., Dept. 356-C
1450 W. 19th St., Chicago 8, Ill.
Without cost or obligation, send me your valuable FREE book of new facts about deafness and how to overcome it.

Name.....
Address.....
Town.....State.....

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 586. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

SPIT, to barbecue meats, fowl or fish in the kitchen oven, is supported over an ordinary open rectangular roasting pan by triangular wire uprights that clamp over the edges of the ends of the pan. Made of chrome-plated steel, the device is sturdily constructed and holds the meat without wobbling.

Science News Letter, September 8, 1951

CHEMICAL VAPOR, automatically made and dispersed by an electrically-operated device, kills insects ranging from flies to chicken lice in the home or the henhouse. Lindane is the trade name of the insecticide use; technically it is an isomer of benzene hexachloride.

Science News Letter, September 8, 1951

COMBINATION SPEED and fishing boat, largely of home design, has two drives, one gasoline, the other electric. Its 125-horsepower automobile engine permits a top speed of 33 miles an hour; its half-horsepower electric motor, battery-operated, has speeds of from one to four miles an hour.

Science News Letter, September 8, 1951

RECORDER-PROJECTOR provides a means of recording "talk" or music magnetically on the edge of 16mm picture film. The sound record is made by use of a microphone attached to the device while the operator is watching the moving pictures on a screen before the instrument.

Science News Letter, September 8, 1951

BLOOD BANK, improved type for hospital use, is a cylindrical refrigerator over seven feet in height, as shown in the photograph. It has seven ball-bearing revolving shelves which permit easy access to the blood sample wanted. Shelves are Wheeling Corrugating Company's expanded metal with diamond-shaped openings.

Science News Letter, September 8, 1951

IMPROVED TELESCOPE, a 60 mm type to be available soon, gives increased image contrast and brilliance, and superior correction of color and flatness of field. Mechanical features include an entirely new method of focusing, by internal movement of a prism.

Science News Letter, September 8, 1951

OUTDOOR SPOTLIGHT, providing 100,000 candlepower wth only a 300-watt rating, is designed to concentrate its entire light output in a long-throw, oval-shaped, narrow floodlighting beam. It is particularly for the protection of vulnerable spots as railroad sidings, shipping docks and airports.

Science News Letter, September 8, 1951

DRYING UNIT, for materials ranging from chemicals to food products, is a horizontal cylindrical affair, mounted on a steel frame, within which is a rotary dryer with drive, screw feeder, air heater, fan and dust collector. Materials to be dried are fed in continuously at one end.

Science News Letter, September 8, 1951

GIFT TO SERVICEMEN:

Send fifty-two weeks SCIENCE NEWS LETTER at the Special Military Gift Rate, 1 year for $4.50

These military Science News Letter subscriptions are entered for delivery to any post here or overseas, and any future changes in address will be made immediately.

SEND GIFT SCIENCE NEWS LETTER SUBSCRIPTIONS FOR ONE YEAR TO:

Name, Rank and Serial No. _____

Address _____

_____

Name, Rank and Serial No. _____

Address _____

_____

And bill me at $4.50 each for these gift subscriptions

Donor's Name _____

Address _____

City _____ Zone _____ State _____

Mail to SCIENCE NEWS LETTER, 1719 N Street, N. W., Washington 6, D. C.

SCIENCE SERVICE
1719 N Street N. W. • Washington 6, D. C.

PUBLIC LIBRARY
TECHNOLOGY DEPT
5201 WOODWARD AVE
DETROIT 2 MICH
REC'D 1951
449-150